

We claim:

1. An adaptive equalizer comprising:
  - a decision device producing a decision device output;
  - a decision feedback equalizer coupled to the decision device, the decision feedback equalizer producing a decision feedback output;
  - an FIR filter coupled to the decision device; and
  - a trellis decoder coupled to the decision device, the trellis decoder producing a reliability output and a decoded output;

wherein an error signal is generated by subtracting the decision feedback output from the decision device output, the error signal being used to update coefficients of the taps of the FIR filter and the decision feedback equalizer; and

wherein a magnitude of the change to the coefficients is selected based at least in part the reliability output of the trellis decoder.
2. The adaptive equalizer of claim 1, wherein the decision device is a slicer.
3. The adaptive equalizer of claim 1, wherein the trellis decoder is a Viterbi decoder.
4. The adaptive equalizer of claim 3, wherein the reliability output is determined by generating a soft output from each decoding stage of the Viterbi decoder, each soft output being equal to a difference between an accumulated metric of a survive path and a

deleted path for the decoding stage, the soft output of a final decoding stage being used as the reliability output.

5. The adaptive equalizer of claim 4, wherein the decision device is a slicer.

6. An adaptive equalizer comprising:

a slicer producing a sliced output;

a decision feedback equalizer coupled to the slicer, the decision feedback equalizer producing a decision feedback output;

an FIR filter coupled to the decision device; and

a Viterbi decoder coupled to the decision device, the Viterbi decoder producing a reliability output and a decoded output;

wherein the Viterbi decoder determines the reliability output by generating a soft output from each decoding stage of the Viterbi decoder, each soft output being equal to the difference between an accumulated metric of a survive path and a deleted path for the decoding stage, the soft output of a final decoding stage being used as the reliability output;

wherein an error signal is generated by subtracting the decision feedback output from the sliced output, the error signal being used to update coefficients of the taps of the FIR filter and the decision feedback equalizer; and

wherein a magnitude of the change to the coefficients is selected based at least in part the reliability output of the trellis decoder.

7. An adaptive equalizer comprising:
  - a decision device;
  - an FIR filter coupled to the decision device;
  - a decision feedback equalizer coupled to the decision device, the decision feedback equalizer producing a decision feedback output;
  - a trellis decoder coupled to the decision device, the trellis decoder producing a reliability output and a decoded output;
  - wherein the error signal is generated by delaying the decision feedback output and subtracting it from the decoded output; and
  - wherein a magnitude of change in the coefficients is selected based at least in part upon the reliability output.
8. The adaptive equalizer of claim 7, wherein the decision device is a slicer.
9. The adaptive equalizer of claim 7, wherein the trellis decoder is a Viterbi decoder.
10. The adaptive equalizer of claim 7, wherein the delayed error signal is delayed by a number of cycles equal to a number of cycles the trellis decoder uses to generate the reliability output.
11. An adaptive equalizer comprising:
  - a slicer;

an FIR filter coupled to the slicer;

a DFE coupled to the slicer, the DFE producing a DFE output;

a Viterbi decoder coupled to the decision device, the Viterbi decoder producing a reliability output and a decoded output;

a mapper coupled to receive the decoded output of the Viterbi decoder and to generate a mapped and scaled output;

wherein the error signal is generated by delaying the DFE output by a number of cycles equal to a number of cycles the Viterbi decoder uses to generate the reliability output and subtracting the delayed decoded output of the DFE from an output of the Viterbi decoder;

wherein a magnitude of change in the coefficients is selected based at least in part upon the reliability output and at least in part upon the error signal.